UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
PREVENTION,
PESTICIDES
AND TOXIC
SUBSTANCES

August 16, 2007

MEMORANDUM

Subject: Efficacy Review for EPA Reg. No. 9480-4, Sani-Cloth Germicidal Wipes; DP Barcode: 341523

From: Tajah L. Blackburn, Ph.D., Microbiologist
Efficacy Evaluation Team
Product Science Branch
Antimicrobials Division (7510P)

Thru: Michele Wingfield, Chief
Product Science Branch
Antimicrobials Division (7510P)

To: Velma Noble Pm 31/ Drusilla Copeland
Regulatory Management Branch I
Antimicrobials Division (7510P)

Applicant: PDI, The Healthcare Division of Nice-Pak Products, Inc.
12510 Prosperity Drive, Suite 160
Silver Spring, MD 20904

Formulations from Label

Active Ingredient(s)	% by wt.
n-Alkyl (68% C_{12}, 32% C_{14}) dimethyl ethylbenzyl ammonium chloride.....	0.25%
n-Alkyl (60% C_{14}, 30% C_{16}, 5% C_{12}, 5% C_{18}) dimethyl benzyl ammonium chlorides.....	0.25%
Other Ingredients.....	99.50%
Total	100.00%

I BACKGROUND

The product, Sani-Cloth Germicidal Wipes (EPA Reg. No. 9480-4), is a registered disinfectant wipe (bactericide, virucide, tuberculocidal) and deodorizer for use on hard, non-porous surfaces in household, institutional, industrial, commercial, and hospital or medical environments. The label claims that the wipe is effective as a disinfectant in the presence of organic soil (5% blood serum). The applicant requested to amend the product registration to add claims for effectiveness as a disinfectant against *Clostridium difficile* and *Escherichia coli* O157:H7. Studies were conducted at BioScience Laboratories, Inc., located at 300 N. Willson Avenue, in Bozeman, MT 59715; and Mycoscience Labs, Inc., located at 25 Village Hill Road, in Willington, CT 06279.

The data package contained a letter from the applicant's representative to EPA (dated April 30, 2007), EPA Form 8570-35 (Data Matrix), two studies (MRID 471575-01 and 471229-02), Statements of No Data Confidentiality Claims for both studies, and the proposed label.

Note: The laboratory reports describe studies conducted for the product, Super Sani-Cloth. The letter from the applicant's representative to EPA (dated April 30, 2007) and the laboratory report assigned MRID 471575-01 states that this product name is an alternate name for the product, Sani-Cloth Germicidal Wipes, which is the subject of this efficacy report.

II USE DIRECTIONS

The product is designed for use on hard, non-porous surfaces such as ambulance equipment, anesthesia machines, bathtubs, bathroom fixtures, bed railings, cabinets, carts, computers, counters, diaper pails, doorknobs, exam tables, faucets, floors, furniture, garbage cans, grocery cart handles, grocery cart child seats, gurneys, gym equipment, handles, hampers, handrails, incubators, instrument trays, laboratory equipment, lamps, light switches, physical therapy equipment, railings, respiratory therapy equipment, shower stalls, sinks, stethoscopes, stretchers, telephones, tiles, toilets, trash cans, toys, ultrasound transducers and probes, urinals, and vanity tops. The label indicates that the product may be used on hard, non-porous surfaces including: Formica®, glass, plastic, and stainless steel. Directions on the proposed label provided the following information regarding use of the product as a disinfectant: Use a wipe to remove heavy soil. Unfold a clean wipe and thoroughly wet surface. Treated surface must remain visibly wet for a full 2 minutes. Use additional wipe(s) if needed to assure continuous 2-minute wet contact time.

III AGENCY STANDARDS FOR PROPOSED CLAIMS

Antimicrobial Products for Use on Hard Surfaces Using Pre-saturated or Impregnated Towelettes

Towelette products represent a unique combination of antimicrobial chemical and applicator, pre-packaged as a unit in fixed proportions. As such, the complete product, as offered for sale, should be tested according to the directions for use to ensure the product's effectiveness in treating hard surfaces. The standard test methods available for hard surface disinfectants and sanitizers, if followed exactly, would not closely simulate the way a towelette product is used. Agency guidelines recommend that a simulated-use test be conducted by modifying the standard test methods. Agency guidelines further recommend that instead of spraying the inoculated surface of the carrier, the product should be tested by wiping the surface of the carrier with the saturated towelette, and then subculturing the slides after a specified holding time. Performance standards of the standard test methods must be met. These Agency standards are presented in EPA Pesticide Assessment Guidelines, Subdivision G, §91-2(h), Pre-saturated or impregnated towelettes; and the April 12, 2001 EPA Memorandum, Draft Interim Guidance for Non-Residual Sanitization of Hard Inanimate Food Contact Surfaces Using Pre-Saturated Towelettes.

Disinfectants for Use on Hard Surfaces in Hospital or Medical Environments (Additional Bacteria)

Effectiveness of disinfectants against specific bacteria other than those named in the AOAC Use-Dilution Method, AOAC Germicidal Spray Products as Disinfectants Method, AOAC Fungicidal Test, and AOAC Tuberculocidal Activity Method, must be determined by either the AOAC Use-Dilution Method or the AOAC Germicidal Spray Products as Disinfectants Method. Ten carriers must be tested against each specific microorganism with each of 2 product samples, representing 2 different product lots. To support products labeled as "disinfectants" for specific bacteria (other than those bacteria named in the above test methods), killing of the specific microorganism on all carriers is required. In addition, plate count data must be submitted for each microorganism to demonstrate that a concentration of at least 10^4 microorganisms survived the carrier-drying step. These Agency standards are presented in DIS/TSS-1.

Supplemental Claims

An antimicrobial agent identified as a "one-step" cleaner-disinfectant must be tested for efficacy with an appropriate organic soil load, such as 5 percent serum. This Agency standard is presented in DIS/TSS-2.

IV SYNOPSIS OF SUBMITTED EFFICACY STUDIES

1. MRID 471575-01 "A Confirmatory Hard Surface Disinfection Evaluation of One (1) Pre-Saturated Towelette Product Versus *Clostridium Difficile* (ATCC #9689; Vegetative Cells)," for Super Sani Cloth, by Jennifer Jill Lawrence. Study conducted at BioScience Laboratories, Inc. Study completion date – August 2, 2006. Laboratory Study Number #060132-204.

This study was conducted against *Clostridium difficile* (ATCC 9689; vegetative cells). Two lots (Lot Nos. SH-III-156 and SH-III-157) of the product, Super Sani Cloth, were tested using the AOAC Germicidal Spray Products as Disinfectants Method (modified for towelettes) as described in the AOAC Official Methods of Analysis, 17th Edition, 2000. The product was received ready-to-use. Successful testing was conducted on July 21, 2006. Heat-inactivated fetal bovine serum was added to the inoculum to achieve a 5% organic soil load. Ten 1" x 3" glass slide carriers per product lot were tested. Each carrier was inoculated with 0.01 ml of a 24-hour old broth culture of the test organism. The carriers were dried for 5 minutes in a 35±3°C anaerobic incubator. One towelette was used to treat 10 carriers; each towelette was folded such that an unused portion of the towelette was used to wipe each of the 10 carriers. The laboratory report did not indicate "how" the carriers were wiped. The product delivered by this wiping was allowed to remain on the carrier surface for 2 minutes at room temperature under anaerobic conditions. Following exposure, each carrier was transferred to a 50 ml centrifuge tube containing 40 ml of Fluid Thioglycolate Medium. [After treatment of the carriers, the used towelette was placed into a sterile Petri dish. After the 2-minute exposure time, the used towelette was subcultured into a sterile tube containing 40 ml of Fluid Thioglycolate Medium.] The tubes were incubated for ~48 hours at 35±3°C under anaerobic conditions. After incubation, the plates were examined for the presence or absence of visible growth. Controls included those for carrier population, purity, growth (i.e., viability), sterility, and neutralization verification.

Note: Protocol deviations/amendments reported in the study were reviewed and found to be acceptable.

Note: The applicant provided the data for a failed trial set up on April 14, 2006. In that trial, the carrier population control count was below the required number (at least 10^4). Thus, the test was invalid. These data were not used to evaluate efficacy of the test product. See pages 15, 16, 17, and 18 of the laboratory report.

Note: The applicant provided the data for a failed trial set up on May 18, 2006. In that trial, contamination was observed in the Reinforced Clostridial Medium used for testing. Thus, the test was invalid. These data were not used to evaluate efficacy of the test product. See page 5 of the laboratory report.

2. MRID 471229-02 "Nice-Pak Products, Inc. Efficacy Study of Single Use Impregnated Towelettes for Hard Surface Disinfection, Bacteria: *Escherichia coli* ATCC #35150, Serotype O157:H7, Surface: Class 1 ft.^{2}" for Super Sani-Cloth, by Richard Arsenault. Study conducted at Mycoscience Labs, Inc. Study completion date – January 9, 2007. Project Number 06-0804NPNY.

This study was conducted against *Escherichia coli* O157:H7 (ATCC 35150). Two lots (Lot Nos. DL-I-98 and DL-I-99) of the product, Super Sani-Cloth, were tested using the AOAC Germicidal Spray Products as Disinfectants Method (modified for towelettes) as described in the AOAC Official Methods of Analysis, 17th Edition, 2000. The product was received ready-to-use. Fetal bovine serum was added to the inoculum to achieve a 5% organic soil load. Four (4) 6" x 6" glass surfaces (i.e., carriers) per product lot were tested. Each 6" x 6" glass surface was inoculated with 0.1 ml of a 24-hour old broth culture of the test organism, so that the total inoculum volume was 0.4 ml per four 6" x 6" sections (i.e., 1 ft^2). The glass surfaces were dried for 30 minutes at room temperature. One saturated wipe was used to wipe a 1 ft^2 inoculated glass surface. Each 6" x 6" glass surface was wiped back and forth in a reciprocal motion so that the entire inoculated surface had been wiped two times. The product delivered by this wiping was allowed to remain on the glass surface for 2 minutes at 22.2ºC (i.e., 72°F) at 48-49% relative humidity. Following exposure, each glass surface was transferred to a sterile composite bag containing 800 ml of AOAC neutralizing broth. [After the 2-minute exposure time, a ~0.1 ml aliquot from the wipe was expressed into a sterile jar containing 100 ml of AOAC neutralizing broth.] The bag containing the four 6"x 6" glass surfaces was sealed and sonicated for 5 minutes in an ultrasonic bath. A membrane filtration technique was used to determine surviving numbers of the challenge microorganism. The entire volume of the glass surface extract and the entire volume of the expressed liquid were filtered through individual sterile bacterial retentive filters. The filters were rinsed with 50 ml of AOAC neutralizing broth. The filters were transferred to the surface of Tryptone Glucose Extract Agar plates containing 25 ml/L AOAC stock neutralizer solution. The plates were incubated for 48 hours at 35-37ºC. After incubation, the plates were examined for the presence or absence of visible growth. Controls included those for dried glass surface counts (i.e., carrier counts), purity, sterility, and neutralizer effectiveness.

V RESULTS

MRID Number	Organism	No. Exhibiting Growth/ Total No. Tested		Carrier Population Counts (CFU/carrier)
		Lot No. SH-III-156	Lot No. SH-III-157	
471575-01	*Clostridium difficile* Carrier Surface Expressed Liquid	 0/10 0/1	 0/10 0/1	9.21 x 10^5
		Lot No. DL-I-98	**Lot No. DL-I-99**	
471229-02	*Escherichia coli* O157:H7 Glass Surface Replicate 1 Replicate 2 Replicate 3 Expressed Liquid Replicate 1 Replicate 2 Replicate 3	 0 0 0 0 0 0	 0 0 0 0 0 0	>1.0 x 10^5 CFU/1 ft^2 glass surface

VI CONCLUSIONS

1. The submitted efficacy data (MRID 471575-01 and 471229-02) support the use of the towelette product, Super Sani-Cloth, as a disinfectant against *Clostridium difficile* (vegetative cells) and *Escherichia coli* O157:H7 on hard, non-porous surfaces in the presence of a 5% organic soil load for a contact time of 2 minutes. Complete killing was observed in the subcultures of the required number of carriers tested against the required number of product lots. Carrier population counts were at least 10^4. Neutralizer effectiveness/ neutralization verification testing showed positive growth of the microorganisms. Growth (i.e., viability) controls were positive for growth. Purity controls were reported as pure. Sterility controls did not show growth.

Note: Although no longer required by the Agency, subcultures of expressed liquid showed complete killing of the challenge microorganisms.

VII RECOMMENDATIONS

1. The proposed label claims are unacceptable regarding the use of the product, Sani-Cloth Germicidal Wipe (also known as Super Sani-Cloth), as a disinfectant against *Clostridium difficile* (vegetative form). The Agency has re-evaluated its acceptance of the Clostridium difficile (vegetative form) on previously accepted claims and requests for new claims. Peer-reviewed scientific literature and case studies have consistently demonstrated that the C. difficile spore is the source of public-health concern. In light of scientific guidance and supporting documentation, the Agency is certain that claims against the vegetative form of *C. difficile* are true statements, but are used in such a way as to give a false or misleading impression to the purchaser (40 CFR 156.10(a)(5)(vii). The Agency considers antimicrobial pesticides to be unique because of the critical

nature of the threat to public health that my result from ineffective use of the products due to obsolete or misleading labeling. As a result, any reference to claims of effectiveness against *Clostridium difficile* (vegetative) OR *Clostridium difficile* (without having supporting data against *C. difficile* spores) are unacceptable. To address the growing need for products in hospital/medical setting, the Agency is moving expeditiously to develop an appropriate test system and performance standards for *Clostridium difficile* spores.

2. The proposed label claims are acceptable regarding the use of the product, Sani-Cloth Germicidal Wipe (also known as Super Sani-Cloth), as a disinfectant against *Escherichia coli* O157:H7 on hard, non-porous surfaces in the presence of a 5% organic soil load for a contact time of 2 minutes. Data provided by the applicant support this claim.

3. In an Agency letter, dated August 22, 2006, efficacy data was unacceptable for *E.coli* ESBL Producing (ATCC #BAA-196), *Candida albicans* (ATCC #14053), *Salmonella choleraesuis* (ATCC #10708), *Pseudomonas aeruginosa* (ATCC # 15442), *Staphylococcus aureus* (ATCC# 6538), and *Staphylococcus aureus* (Methicillin Resistant) due to lower control carrier counts per 1 ft^2 ("The control carrier counts per 1 ft^2 were lower than the minimal acceptable load when using one towelette per 10 carriers at 10^4/carrier (10^5). The Agency failed to document resolution of this issue. Will you please forward the correspondence sent to the Agency that resolved this issue?

4. The claim "Bonus" on page 6 of the proposed label is ambiguous. Please remove or clarify.

5. Refer to the Agency's guidance to the use of the term "germ" on the proposed label. As it is currently proposed on the label, the use of this term requires qualification (http://www.epa.gov/oppad001/germs.htm).

6. The proposed label states that the product can be used to deodorize hard, non-porous surfaces [see page 6 of the proposed label]. To satisfy DIS/TSS-16 requirements, the label must be revised to provide adequate dosage recommendations and complete directions for use of the product as a deodorizer.

7. The following changes are required on the proposed label:

- On page 6 of the proposed label, change "control . . . between treated surfaces are required" to read "control . . . between treated surfaces is required."

- On page 9 of the proposed label, change "(except precleaning is required for blood and body fluids)" to read "(except pre-cleaning is required for heavy soil and blood and body fluids)."

- On page 4 of the proposed label, change "tiled walls" to "glazed tiled walls".

- On page 6 of the proposed label, for the statement “Effective against bathroom bacteria and viruses” please list relevant organisms for which efficacy has been demonstrated.

- On page 7 of the proposed label, include “treated surfaces” in the claim “Helps prevent cross-contamination on treated surfaces”.

- On page 7 of the proposed label, remove the word “power”, as this implies a heightened level of efficacy.

- On page 7 of the proposed label, remove the statement “Starts killing [bacteria] on contact” as this implies immediate efficacy.

- On page 7 of the proposed label, for the statement “ Kills germs and bacteria and viruses in the bathroom…” list relevant organisms for which efficacy has been demonstrated.

- The statement “New and improved” must be removed from the label. The timeframe for this claim has expired.